

Here we have Mr. Nice Guy, the quiet man from the southern provinces, with his "Tiger Tail." Ron never pushes to the front but makes his presence felt when out on the flight line!

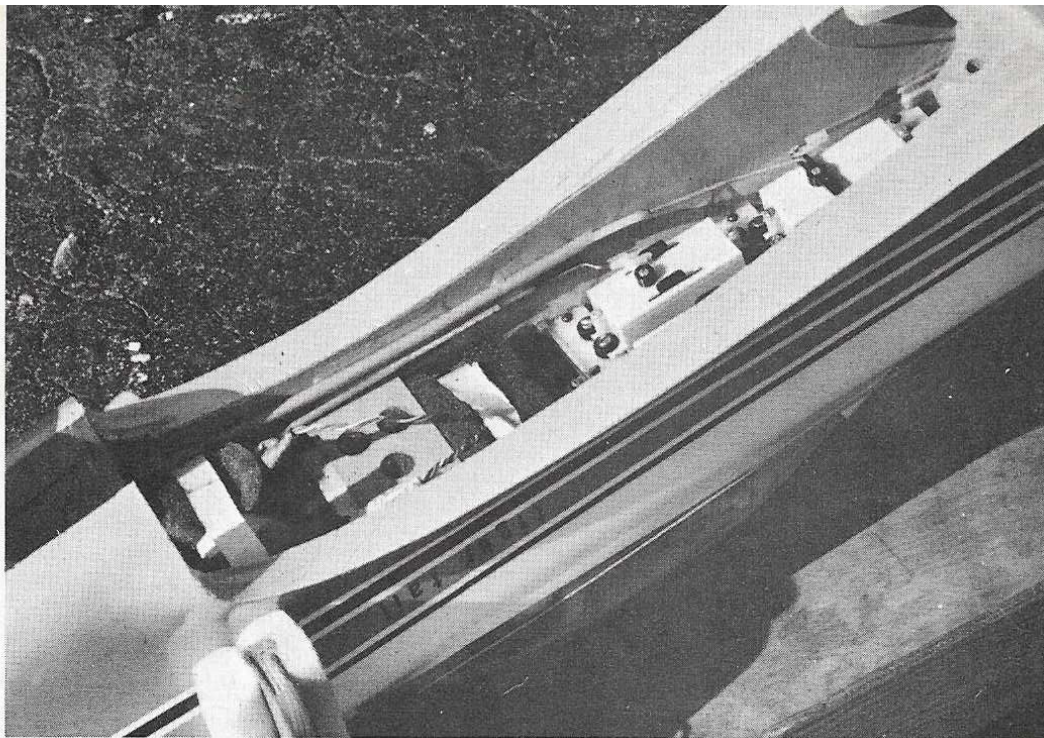
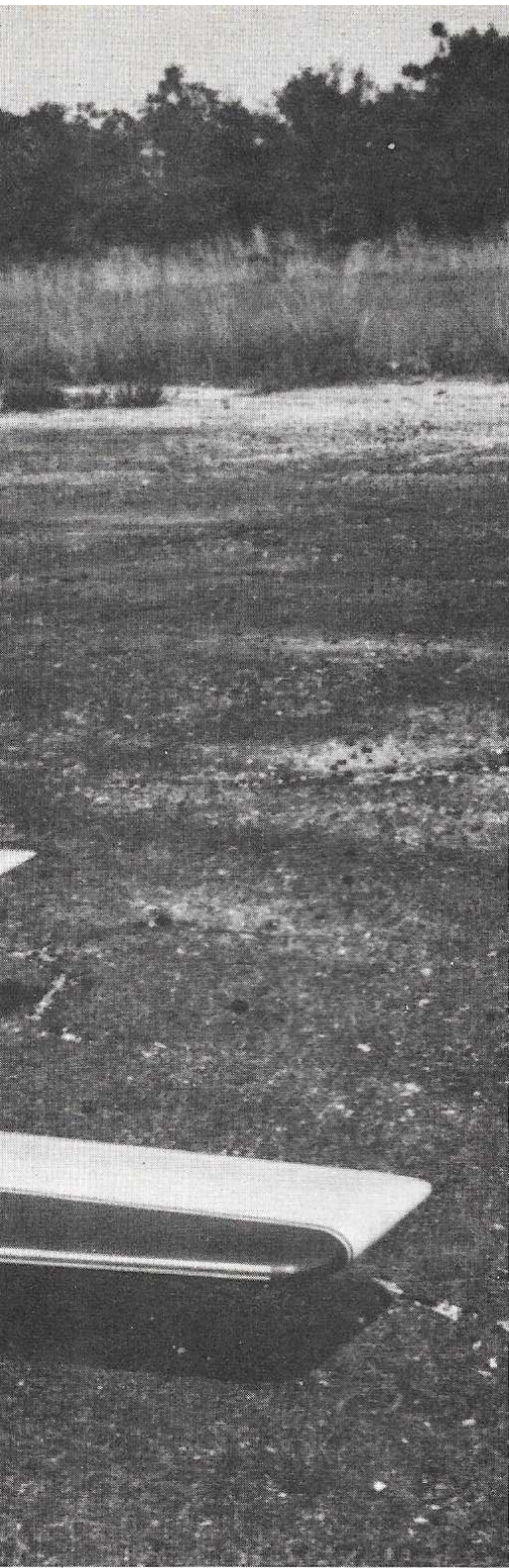


tiger tail

BY RON CHIDGEY

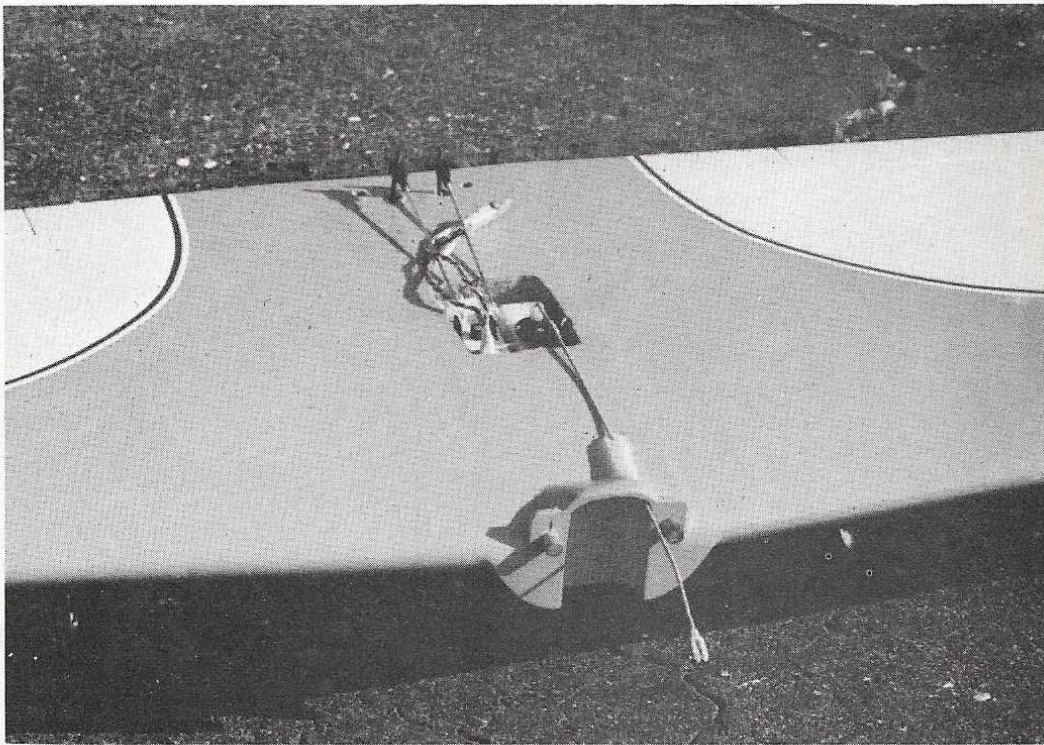
Continuing M.A.N.'s policy of always presenting the Nats winners, herewith the 1971 National Pattern winner. Good-looking, very efficient Stunter performed flawlessly under the masterful hands of our gentleman from the South.

• In opening this discussion of the "Tiger Tail," I guess I'm supposed to give you a sales pitch that will convince you to build one. I'm really not too sure if this is a good idea, since your flying will probably improve and us old folks don't need any of that! It gets tougher to win every year. And besides, "Tiger Tail" really has only two things of any importance going for it—It's *ugly* and it's *honest!* The "ugly" part helps, since everyone *knows* ugly airplanes fly better, witness Quik-Fli, Daddy Rabbit, and Cutlass! One of my grammar school drop-out friends once



A look inside the "Tiger Tail" shows compact arrangement for all the electronic goodies.

View of the wing with aileron and retract servo installation. Note nose wheel well-section.



remarked in a kidding session "It's ugly enough to be called a trainer." The only reply I could manage was "Pretty is as pretty does."

Which brings us to its most important attribute: "Tiger Tail" is a completely honest airplane. Honest! I have built six of them over the past two years, one with fixed gear, and they have all flown almost identically, being completely predictable in their flying characteristics. I think this thing of "honesty" or "predictability" is the single most important factor a competition airplane can bring to the party. It far outweighs most

other differences in design and styling. Needless to say, it is very disconcerting to have your airplane do something completely uncalled for in the middle of a heated contest.

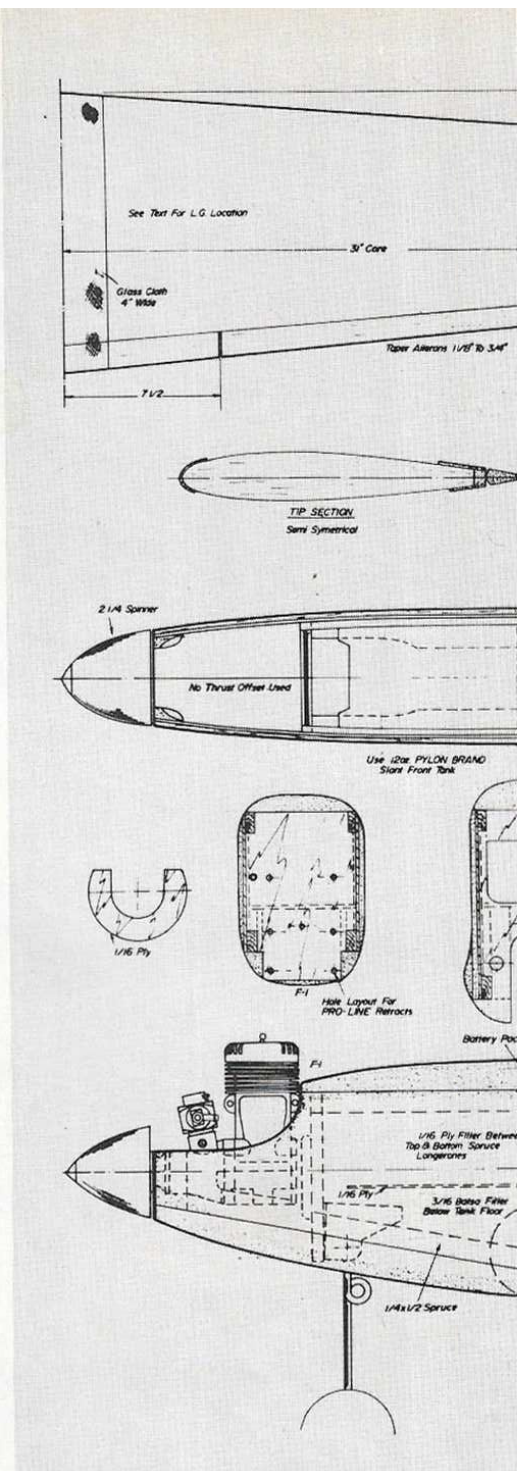
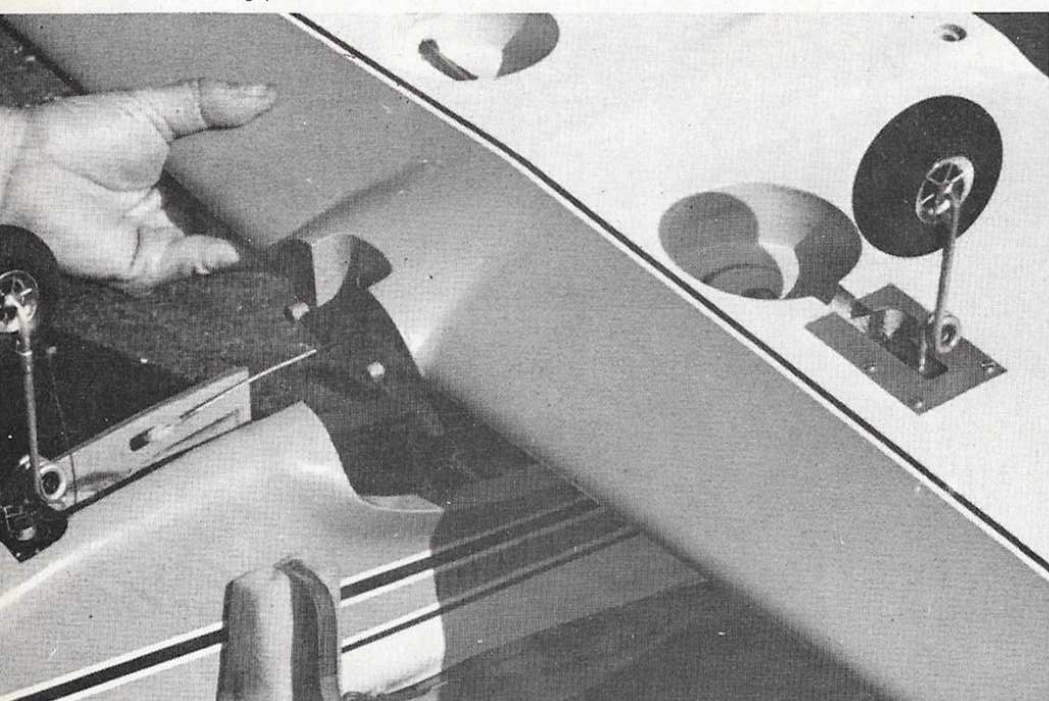
If the quality of our flying has improved over the past four or five years, and I think it most certainly has, it is primarily due to 1) better radio equipment, 2) better engines, and 3) retractable landing gears. Airplane design (or style) may have made a marginal contribution, but it is a secondary factor. There are several "vintage" designs, given the benefit of our really good

radios and engines and modernized with retracts, that could win today as easily as they did yesterday. In fact, I think we sometimes design ourselves into a built-in handicap in an effort to be different. I guess my philosophy has been to strive for good flying characteristics first and aesthetics second. A good competitive design should certainly minimize the work the pilot has to do. You will be surprised how good a "conventional" type like "Tiger Tail" begins to look after you have won a few first places with it. I know that last



Close-up of the ProLine nose wheel installation. ProLine retract gear is a Chidgey design.

View of wing placement to the fuselage shows main retracts in wing, pushrod for nose wheel.



TIGER TAIL

July, in Chicago, it was the most gorgeous airplane I had ever seen!

While "Tiger Tail" isn't a radically new design, it does have a few subtle differences worth mentioning. You will notice the airfoil progresses from a rather thick symmetrical center section to a lifting tip section. I don't make any great claims for this combination; however, "Tiger Tail" can be slowed down very nicely for landing without any fear of abrupt tip stalls, whereas many other designs with sharply tapered wings cannot. I don't know whether this is all due to the lifting tip, but I think it helps. The thick (17%) center section gives a good degree of air speed control. When you throttle back, the airplane slows at a good rate, but, oddly enough, the top end doesn't suffer.

"Tiger Tail" was as fast as most at last year's Nats.

The strip ailerons begin fairly far outboard—for a good reason. The inboard portion of the strip is ineffective for generating rolling forces, but does contribute lots of drag when pushed out into the breeze. The inboard configuration improves the rolls by keeping speed up.

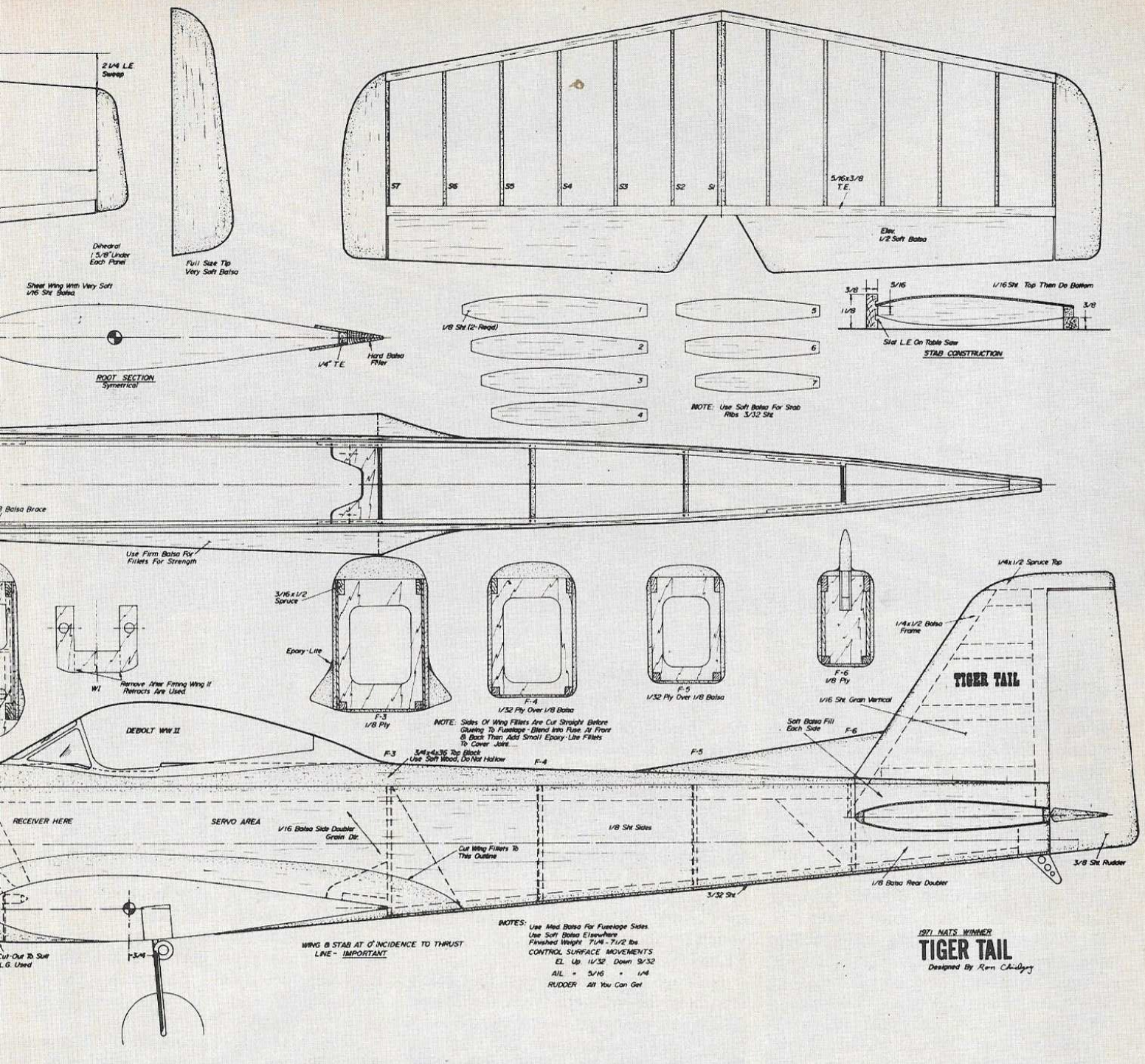
The fuselage shape is narrow and deep up front, as you might expect, but it also has a relatively wide tail cone, which may seem a bit odd. This was done to structurally stiffen the fuselage and provide a more rigid mount for the tail surfaces. If possible, I wanted to eliminate some of the flutter of the control surfaces caused by vibration. This flutter is transmitted

through the pushrods and really works on the servo feed back pots.

Simplicity is the essence of good design and "Tiger Tail's" construction is simple and straightforward. If you must build one, let me carry you through the building sequence, almost step-by-step, since it may save you some time.

CONSTRUCTION

Wing: Cut foam cores from #1 (1 lb.) foam. Be sure you cut a left and a right panel. Mark them immediately after cutting, because it is difficult to see the slight amount of lift in the tip section. The sections shown on the plans are for a female template, and the template is made *exactly* the size shown on the plans. The wing section itself will come out approximately



1/32" smaller all around. If you cut with a male template, take this into consideration.

Add trailing edge to cores, sanding to the wing contour. Sheet cores with the softest 1/16" balsa you can find, using Southern R/C's Sorghum contact cement. Join panels with correct dihedral angle. Again, watch that left and right panel!

Add aileron torque rods and center section trailing edge filler. Fiberglass the center section and add tips. Tack-glue ailerons in place and sand wing.

Mark landing gear block and wheel-well location to suit your favorite brand of retracts. I used the ProLine gear. Main gear tread should be 15 inches. Line wheel-wells with 1/32" balsa. Paint remainder of gear cutout

with Tite Bond thinned with water to protect the foam from attack by the finishing materials.

Stab and Fin: Cut out stab parts from *soft* balsa. The slotted LE is easily made on a table saw. Pin LE and TE in place over a *flat* surface and add ribs. Allow to dry before gluing the top sheeting in place. Flop stab and add bottom sheeting. Trim LE and add tips. Tack-glue elevators in place and sand stab.

Build the fin from *soft* balsa. The fin tip is spruce. Tack glue rudder in place and sand assembly to airfoil shape.

Fuselage: Cut the sides from medium 1/8" sheet and add the 1/16" medium balsa front doublers and 1/8" soft balsa rear doublers. Cut out all formers. Select a soft, straight piece of 3/4" x 4"

balsa for the top block. Mark the centerline, the fuselage outline, and the position of the formers on the block; tack-glue block to a flat table top using a few spots along each side. Glue formers in place using epoxy at F-1 and F-2. Tite-Bond is preferred elsewhere. Glue 3/16" x 1/2" spruce longerons in place following the contour of the fuselage. Add 1/4" x 1/2" spruce bottom longerons between F-1 and F-2. Glue fuselage sides in place and allow to dry.

Add 1/4" square balsa rear bottom longerons, the 1/16" plywood tank compartment doubler and the 1/16" plywood tank floor. Add the 3/16" doubler below the tank floor then add nose wheel-well blocks. Install nose



Close-up of the cockpit canopy and the reason for the "Tigertail." Note the excellent finish of the plane which is a Chidgey trademark!

TIGER TAIL

gear temporarily and install nose wheel steering Nyrod and throttle Nyrod. Install elevator and rudder pushrod guides at rear of fuselage. Sheet bottom of rear of fuselage and add wing hold-down plate and 1/8" side braces.

Remove fuselage from the work bench and temporarily install the engine. Use a dummy wooden spinner back plate to locate and center the 1/16" plywood nose ring and glue the nose ring to the fuselage sides. Add the bottom nose block and corner fillers of soft balsa. Shape top block, nose blocks and bottom to outline shown on plans.

Cut the wing fillets to outline shown on the side and top views. Shape to a triangular cross section and glue in place. Fair into fuselage and add a small Epoxylite fillet to blend the fillet into the fuselage. Block up the fuselage and carefully glue the stab and fin in place. Be certain stab is 0-0 with the thrust line (or top of fuselage sides) and fin is true with fuselage center line. Add the small block to shape fuselage above stab. Add a small Epoxylite fillet around stab and fin, and you are done.

FINISH

My "Tiger Tails" have all been covered with Southern R/C's Skyloft spun bonded nylon and finished with acrylic lacquer plasticized with Flexall plasticizer. I follow to the letter the finishing method detailed in the Skyloft instruction sheet and have had no finishing problems. It is a fast system and is light. I think it contributes a great

deal toward holding the weight of my ships within the 7-7½ # range. I use Aerogloss clear to seal the wood, to apply the Skyloft and finally to seal the Skyloft. I use DuPont #308 lacquer primer (also plasticized with Flexall) and Martin Senour acrylic lacquer for the finish coats. This combination of products works well for me. Others may work equally well; I just can't vouch for them.

FLIGHT TRIM

Now we come to the part that really separates the winners from the losers. A lot of potential winners will stay just that, potential winners, because they quit too soon. They are so relieved to finally get the new bird in the air (and a little surprised that it really flies pretty good), and they never take the time to really trim it properly. Instead they let the airplane trim them out, adapting to the "ornery" things and idiosyncrasies and forever competing at a disadvantage. So do it right this time. Perform the following pre-flight checks before you ever leave the shop:

1. While not a critical adjustment, the engine thrust should be 0-0 with the fuselage centerline and also the side reference line (top of the fuselage sides).

2. Be certain the wing and stab are at 0° with the reference line. Measure this, don't just eyeball it.

3. Check the C.G. location. It should be 3¾" back from the leading edge. Don't be concerned about having to

add weight to properly locate the C.G. It is a small penalty to pay for having it right.

4. Balance the wing, or, better still, the airplane, about the roll axis. I use a 6 penny nail, cut to the right length, to balance the wing. Just push it into the soft tip, but don't seal it permanently as you will possibly have to make some fine adjustments later.

5. Set control surface throws as shown on the plans. You may like a slightly different feel than I do but this is a good place to start.

6. Now go fly . . .

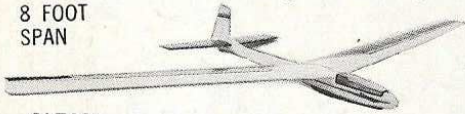
After a few "get acquainted" flights you will want to fine tune the trim. If you will make two critical adjustments, and work with them until you get them right, you will have a good flying Tiger. I'm assuming now that the C.G. and wing and stab incidence were put right in the pre-flight checks. First, adjust the lateral balance and aileron neutrals until the ship tracks through both inside and outside loops with virtually no corrections. You should be prepared for a whole afternoon of nothing but inside and outside loops. After going through this exercise, you should be convinced of the value of lateral balance. A slight out-of-balance condition can really tear up your looping maneuvers since the normal thing to do is to compensate with opposite aileron. Then when the airplane is inverted, the out-of-balance condition and the aileron deflection are acting in the



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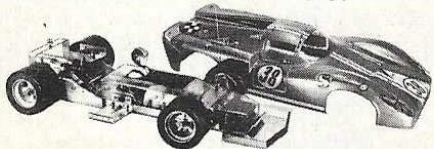
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build it true, it's true forever). Ailerons can sometimes be straightened with a little steam and pressure. The effect of a very slight aileron warp can be reduced by raising both ailerons a couple of turns on the clevis giving a slight wash-out to the trailing edge. Make adjustments slowly, carefully thinking each one out, and you will be pleased with the results.

The second critical adjustment you will want to make is aileron differential. Some flyers determine the amount of aileron differential required by pulling the airplane up into a climb and doing a split "S." If the nose pulls off heading, they add differential until it tracks straight. This requires an excessive amount and usually results in rolls that are somewhat "barrel roll." I prefer to set the differential by the airplane's behavior in the rolls, especially the four point. Use as much differential as possible without the nose yawing off heading when you rapidly roll from upright to knife edge. The important thing is to not compromise the high speed rolls and four point too much for the sake of a few turn around maneuvers. The best way to adjust aileron differential is by bending the aileron horns—forward to increase, back to decrease. The differential shown on the plans should be about right, but do make the in-flight checks before considering the airplane trimmed.

Now, go win! ■

Tiger Tail

same direction!! It is sometimes difficult to tell whether it is balance or an aileron or wing warp, but in general, if you must correct part of the loop with ailerons in one direction and part in the opposite direction, it is balance. If you must correct with the same aileron direction through the whole loop, it is a warp condition. It is a simple matter to correct on out-of-balance condition, but warps are a problem. A warped balsa sheeted foam wing is warped forever (of course, if you